



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,706	06/23/2003	Makoto Matsuoka	500.38284CP2	5745

20457 7590 09/21/2004

ANTONELLI, TERRY, STOUT & KRAUS, LLP  
1300 NORTH SEVENTEENTH STREET  
SUITE 1800  
ARLINGTON, VA 22209-9889

EXAMINER

OSELE, MARK A

ART UNIT	PAPER NUMBER
----------	--------------

1734

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/600,706		MATSUOKA ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Mark A Osele		1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 5-16 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 is/are allowed.
- 6) ☒ Claim(s) 5-10 and 12-15 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>06232003</u> . | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 5 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Publication 52-27352 (Sato) in view of Heist et al. and Takeuchi et al. Sato shows an apparatus for peeling an adhesive sheet from a diced wafer comprising a vacuum chuck, 1, for sucking the side of the diced wafer, 7, opposite the adhesive sheet, 6, and a guide, 9, with a wedge shaped tip such that the adhesive sheet is peeled along the surface of the wedge shaped tip as the guide is moved in a direction opposite the to the tip of the guide (English Abstract, Fig. C). Sato fails to show a stocker for the wafer, a guide unit for moving the guide, and a chucking unit for holding the adhesive sheet.

Heist et al. shows an apparatus for peeling an adhesive sheet from a substrate wherein a clamp, 13, grips the edge of the adhesive sheet and peels it backward along the wedge shaped tip, 25, of the guide, 16. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the clamp of Heist et al. in the apparatus of Sato because this clamp is shown to provide automation for the peeling of an adhesive sheet.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a guide unit for moving the guide of Sato to provide automation as well as to ensure a steady movement of the guide for gentle separation of the adhesive sheet from the diced wafer.

The references as combined fail to show a stocker and a carrying unit for the wafer and adhesive sheet laminate.

Regarding claims 7-9, the limitations of peel orientation is dependent upon the directional placement of the wafer, which is a material worked upon limitation. The apparatus of the references as combined would be capable of peeling the adhesive sheet at the claimed angle if the wafer is placed in the apparatus at that angle.

Takeuchi et al. shows an apparatus for dicing a wafer and separating the chips from the adhesive sheet wherein a stocker holds a plurality of wafers adhered to an adhesive sheet and a ring frame so that the wafers can be automatically supplied to each of the processing stations (column 4, lines 58-66). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a stocker and wafer carrying units to the apparatus of the references as combined above because Takeuchi et al. shows this level of automation to be known and because Takeuchi et al. teaches that the use of a stocker and carrying units allows for various processing units to operate at different rates (column 4, line 66 to column 5, line 30).

Art Unit: 1734

3. Claim 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Publication 52-27352 (Sato) in view of Heist et al. and Takeuchi et al. as applied to claim 5 above, and further in view of Platzer. The references as combined fail to show the claimed angle of the guide tip. Platzer shows an apparatus for peeling a sheet from a substrate wherein the sheet is peeled around a guide tip. Platzer teaches that the angle of the guide tip is preferably less than 20°. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an angle of 15° for the guide tip of the apparatus of the references as combined because Platzer teaches that the preferable peel angle has a range which includes this angle. The exact angle within the range would be determined by routine optimization.

4. Claims 10 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Publication 52-27352 (Sato) in view of Heist et al., Takeuchi et al., and Moore. Sato shows an apparatus for peeling an adhesive sheet from a diced wafer comprising a vacuum chuck, 1, for sucking the side of the diced wafer, 7, opposite the adhesive sheet, 6, and a guide, 9, with a wedge shaped tip such that the adhesive sheet is peeled along the surface of the wedge shaped tip as the guide is moved in a direction opposite the to the tip of the guide (English Abstract, Fig. C). Sato fails to show a stocker for the wafer, a guide unit for moving the guide, and a chucking unit for holding the adhesive sheet.

Heist et al. shows an apparatus for peeling an adhesive sheet from a substrate wherein a clamp, 13, grips the edge of the adhesive sheet and peels it backward along the wedge shaped tip, 25, of the guide, 16. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the clamp of Heist et al. in the apparatus of Sato because this clamp is shown to provide automation for the peeling of an adhesive sheet.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a guide unit for moving the guide of Sato to provide automation as well as to ensure a steady movement of the guide for gentle separation of the adhesive sheet from the diced wafer.

The references as combined fail to show a stocker and a carrying unit for the wafer and adhesive sheet laminate.

Takeuchi et al. shows an apparatus for dicing a wafer and separating the chips from the adhesive sheet wherein a stocker holds a plurality of wafers adhered to an adhesive sheet and a ring frame so that the wafers can be automatically supplied to each of the processing stations (column 4, lines 58-66). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a stocker and wafer carrying units to the apparatus of the references as combined above because Takeuchi et al. shows this level of automation to be known and because Takeuchi et al. teaches that the use of a stocker and carrying units allows for various processing units to operate at different rates (column 4, line 66 to column 5, line 30).

Art Unit: 1734

The references as combined fail to show a second sucking mechanism. Moore shows an apparatus for holding a diced wafer, removing individual chips, and transporting them for use in an electronic apparatus. Moore shows that a first sucking mechanism, 16, retains the diced wafer on the adhesive sheet and a second sucking mechanism, 28, lifts the individual chips. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the second sucking mechanism of Moore in the apparatus of the references as combined because Moore shows this to be a typical device for taking the chips from their positions in the wafer to a useful assembly location.

Regarding claims 13-15, the limitations of peel orientation is dependent upon the directional placement of the wafer, which is a material worked upon limitation. The apparatus of the references as combined would be capable of peeling the adhesive sheet at the claimed angle if the wafer is placed in the apparatus at that angle.

5. Claim 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Publication 52-27352 (Sato) in view of Heist et al., Takeuchi et al., and Moore as applied to claim 10 above, and further in view of Platzer. The references as combined fail to show the claimed angle of the guide tip. Platzer shows an apparatus for peeling a sheet from a substrate wherein the sheet is peeled around a guide tip. Platzer teaches that the angle of the guide tip is preferably less than 20°. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an angle of 15° for the guide tip

Art Unit: 1734

of the apparatus of the references as combined because Platzter teaches that the preferable peel angle has a range which includes this angle. The exact angle within the range would be determined by routine optimization.

***Allowable Subject Matter***

6. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claim 16 is allowed.

8. The following is a statement of reasons for the indication of allowable subject matter: None of the prior art teaches the first sucking mechanism to hold the diced wafer from above and to invert the wafer after the adhesive sheet is peeled therefrom. Hartmann et al. shows inverting a diced wafer using two separate holding tools but neither one uses suction to hold the inverted wafer from above. Bond et al. shows using a suction tool to lift individual chips and invert them for placement but gives no motivation to do this for an entire wafer

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bechmann shows a clamp lifting an adhesive sheet along an angled peeling guide. McKenna et al. and Pak each show peeling an

Art Unit: 1734

adhesive sheet from a diced wafer around a peeling guide. References to Ong et al., Matsuoka et al., Tsujimoto, and Odajima et al. each show peeling devices for adhesive sheets from a diced wafer but none of the references are prior art.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark A Osele whose telephone number is 571-272-1235. The examiner can normally be reached on Mon-Fri 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**MARK A. OSELE**  
**PRIMARY EXAMINER**

September 18, 2004